

NOTES ON THREE SPECIES OF *HETEROCAMPA* DOUBLEDAY
WITH DESCRIPTION OF A NEW SPECIES
(LEPIDOPTERA: NOTODONTIDAE)

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ABSTRACT—*Heterocampa benitensis*, n. sp., is described from Texas; this species was previously misidentified as *H. superba* Hy. Edw. or *H. subrotata* Harvey; the status of these two species and of *H. belfragei* Grote is confirmed.

I have had in my collection, for some time, a short series of an undescribed species of *Heterocampa* Doubleday. Other specimens of the same species are in the collections of the U.S. National Museum, the American Museum of Natural History, the Illinois Natural History Survey, and Dr. J. G. Franclemont. A description of this new species follows.

Heterocampa benitensis, n. sp.

Male. Head olive green; palp short, porrect, not exceeding front, brown exteriorly. Collar, disc of thorax and patagia olive green. Fore and middle tibia covered with long, loose olive green scales, with transverse medial and terminal black lines. Forewing olive green; t. a. line double, wide, filled with ground color, excurved between veins, especially in cell Cu2 and below anal vein. Basal space darkened by sprinkling of black scales; t. p. line double, strongly lunulate and outwardly dentate on veins, narrower than t. a. line, filled with ground color, best defined between R5 and Cu2; inner component black, narrow; outer component more diffuse. Adterminal line continuous, black, narrow, slightly outwardly dentate on veins, parallel to outer margin at a distance from it about equal to width of fringe. Terminal line obsolescent. Fringe olive green indistinctly checkered with black scales at vein ends. S. t. line represented, midway between t. p. and adterminal lines, from cells R5 to Cu1, by dark shadow accented by black spots between veins, more markedly in cells R5 and M3. A conspicuous, almost pure white fascia from apex to between t. p. line and top black spot of s. t. line. Reniform a narrow black lunule. Median space darkened along a diffuse barely traceable median shade and beyond reniform lunule. Succession of blackish and lighter spots on costa, the spot above reniform being nearly pure white. Hindwing sordid white, darker along termen. Undersurface of forewing fuscous, darker in costal half; three to four black spots on costa at ends of radial veins. Undersurface of hindwing whitish.

Wing expanse: 29 to 33 mm.

Female. Forewing olive green, spotted mostly in outer half with reddish. Differs strikingly from male in having a subterminal line of nearly confluent black spots, extending almost from apex to inner margin, widest in cell M2, constricted in cell M3, preceded by a whitish shade in its upper half. Subterminal spot in Cu1 and lunulate reniform meet on a diffuse black shadow and together form a bold black half circle. Hindwing fuscous, darker beyond a fine mesial shade line.

Wing expanse: About 38 mm.

Male genitalia: As shown in figs. 11, 11a, 11b, and 11c.

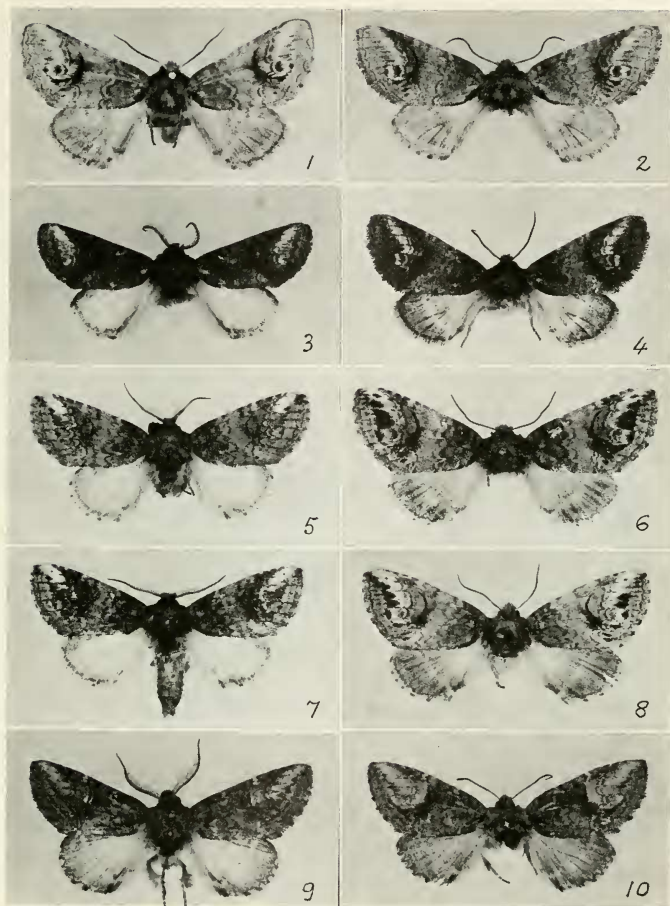
Female genitalia: As shown in fig. 12.

Holotype male, Brownsville, Texas, 8 August 1967, A. & M. E. Blanchard collectors, genitalia on slide A.B. 688, deposited in the U.S. National Museum, type number 64647.

Paratypes: One female, San Benito, Texas, 8 Sept. 1915, genitalia on slide A.B. 2270, in the collection of the Illinois Natural History Survey. One male, Shovel Mountain, Texas, May 1916, "Barnes Collection", genitalia on slide A.B. 1361; one male, Brownsville, Texas, 23 Oct. 1928, F. H. Benjamin collector, "Barnes Collection", genitalia on slide A.B. 1362; one female, San Benito, Texas, 8 Sept. 1915, "Barnes Collection"; one female, Esper Ranch, Brownsville, Texas; one female, San Benito, Texas, 8 Sept. 1915, "Barnes Collection", genitalia on slide A.B. 1359; one female, San Benito, Texas, 8 Sept. 1915, "Barnes Collection", genitalia on slide A.B. 1357, in the U.S. National Museum. One male, Brownsville, Texas, 3 April 1929, "Otto Buchholz Collection", F. H. Benjamin collector, genitalia on slide A.B. 2402; one male, Brownsville, Texas, 22 October 1928, "Otto Buchholz Collection", genitalia on slide A.B. 2403; one male, Brownsville, Texas, 19 October 1928, "Otto Buchholz Collection", F. H. Benjamin collector, genitalia on slide A.B. 2404, in the collection of the American Museum of Natural History. One male, Sinton, Texas (Welder Wildlife Foundation), 2 May 1967, A. & M. E. Blanchard collectors, genitalia on slide J.G.F. 5456; one male, Brownsville, Texas, 8 May 1967, A. & M. E. Blanchard collectors, in J. G. Franclemont's collection. One male, Santa Rosa, Texas, 18 November 1965; one male, two females, Santa Rosa, Texas, 14 April 1966, female genitalia on slides A.B. 1353 and A.B. 2269; three males, Brownsville, Texas, 5 and 9 November 1969; one male and two females, Santa Ana National Wildlife Refuge, 23 and 26 October 1970, in A. & M. E. Blanchard's collection.

Some specimens of *H. benitensis* have been in several collections for a long time. It seems that they were, either set apart for further study or tentatively identified as *H. superba* Hy. Edwards. As *H. superba* Hy. Edwards (1884) was first synonymized with *H. subrotata* Harvey (1874) by Neumoegen and Dyar (1894), this course of action amounted to doubting the synonymy. This writer, for a time, was among the doubters.

The female type of *H. superba*, originally part of the Bolter collection, is now in the collection of the Illinois Natural History Survey. Dr. R. W. Poole of that institution and the writer examined it, prepared its genitalia, took a picture of it (fig. 1), and concluded in agreement with Neumoegen and Dyar (1894) and Packard (1895), that *H. superba*, which was described from that single female specimen, is definitely a junior synonym of *H. subrotata*.



Figs. 1-10, *Heterocampa* species: 1, *superba* Hy. Edw., type ♀, coln. Ill. Nat. Hist. Sur., orig. Bolter Coln., slide A.B. 2271; 2, *subrotata* Harvey, ♀, Sinton, Texas, Welder Wildlife Found. Ref., slide A.B. 2268; 3, *subrotata*, ♂, Sheffield, Texas, dark specimen, slide A.B. 1343; 4, *subrotata*, ♀, Laguna Park, Texas, dark specimen, slide A.B. 2267; 5, *benitensis*, n. sp., holotype ♂, Brownsville, Texas, slide A.B. 688; 6, *benitensis*, paratype ♂, Santa Rosa, Texas, slide A.B. 2269; 7, *benitensis*, paratype ♂, Santa Rosa, Texas; 8, *benitensis*, paratype ♀, San Benito, Texas, coln. Ill. Nat. Hist. Sur., slide A.B. 2270; 9, *belfragei* Grote, ♂, Laguna Park, Texas, slide A.B. 2187; 10, *belfragei*, ♀, Laguna Park, Texas, slide A.B. 2238.

The maculation of *H. benitensis*, male as well as female, resembles that of the corresponding sex of *H. subrotata*, but there are differences, as can be recognized from a close examination of figs. 1 to 8. Most typical are the differences in the white apical fascia of the male and the subterminal spots of the female. The genitalia, male as well as female, are abundantly different.

H. subrotata is somewhat variable. The ground color varies from a light ashy green to blackish, and the whitish fascia near the apex may be entirely missing. It is far from certain that any of these forms deserves a subspecific name. Dr. Allan Watson of the British Museum (Natural History) compared my drawing of slide A.B. 1346 with the genitalia of the types of *H. subrotata* and *H. celtiphaga* and concluded: "The genitalia of the types *subrotata* and *celtiphaga* are identical and correspond perfectly with A.B. 1346" (fig. 13). He also confirmed that the expanse given for the type of *celtiphaga* as 18 mm. should be 28 mm. which is the expanse shown in the figure given with the original description (Harvey, 1874).

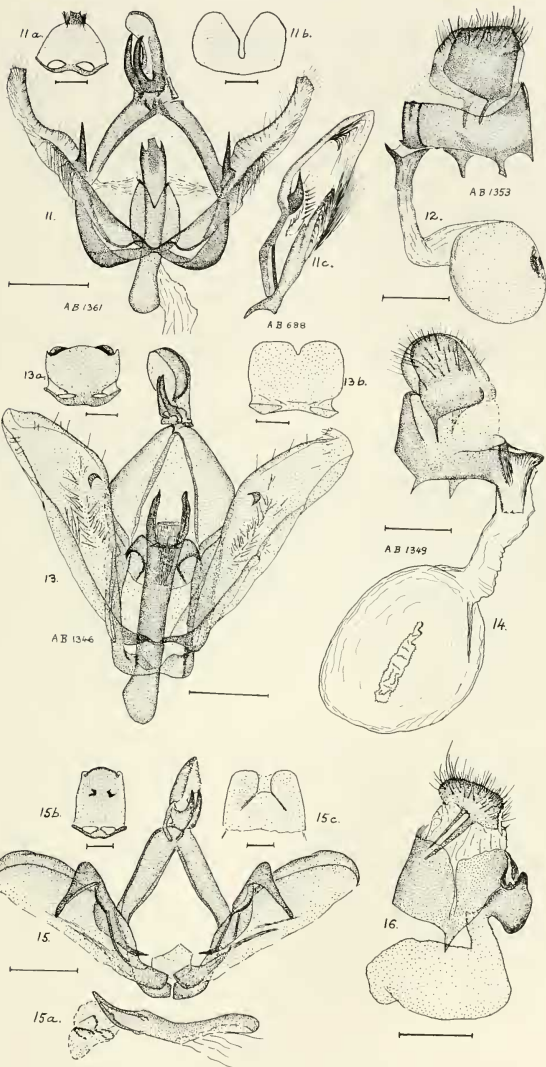
Another *Heterocampa* species which is still rare in collections, and as a consequence of this appears to be generally not well understood is *H. belfragei* Grote (1879). The male lectotype and three male paralectotypes are in the British Museum (Natural History). I have in my collection four males and one female which I consider to be authentic *belfragei*, and I hope to clarify the status of this species by publishing pictures of one male and one female (figs. 9 and 10), a drawing of the genitalia of the male lectotype (figs. 15 and 15a), and of my only female (fig. 16).

My specimens agree extremely well with Grote's original description (1879) which follows:

"This species is less distinctly marked than usual, of moderate size. The tone of the forewings is olive gray with a narrow curved brown discal mark, and the broken subterminal line is composed of brown spots, indented on interspace between veins 4 and 5, and preceded by a diffuse whitish shade superiorly. A short narrow curved black basal streak. Median lines double, interspaceably lunate, indistinct. Hindwings pale, more or less markedly dusky on costa and internal margin, crossed by incomplete double extramesial shade lines. Thorax like forewings; the tuft behind blackish, and the tegulae edged incompletely with black.

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Figs. 11, 12, *Heterocampa benitensis*, n. sp.: 11, ♂ genitalia (A.B. 1361); 11a, 8th sternite; 11b, 8th tergite; 11c, right valve, inner aspect (A.B. 688); 12, ♀ genitalia, lateral aspect (A.B. 1353). Figs. 13, 14, *H. subrotata* Harvey: 13, ♂ genitalia (A.B. 1346); 13a, 8th sternite; 13b, 8th tergite; 14, ♀ genitalia, lateral aspect (A.B. 1349). Figs. 15, 16, *H. belfragei* Grote: 15, ♂ genitalia of type, aedeagus omitted; 15a, aedeagus, vesica exerted; 15b, 8th sternite; 15c, 8th tergite (slide prepared by J. G. Franclemont); 16, ♀ genitalia (A.B. 2238). All lines represent 1 mm.



Beneath pale, without markings, except a dark common shade line near the margin of the wings, which is not always noticeable. Average expanse 36 millimeters."

Dr. Allan Watson compared the photographs of *H. belfragei* (figs. 9 and 10) with the specimens in his care and concluded that they "seem to match the lectotype of *belfragei* quite well, although the dark spots on the fringe of the forewing at the distal end of each vein seem to be much more conspicuous in your specimens than in the type or the three paralectotypes". Dr J. G. Franclemont had prepared a slide from the lectotype and had it on loan from the British Museum when he visited with us lately. We compared it with my three male slides and concluded that they matched satisfactorily. Three of my specimens were collected at Laguna Park, Texas, less than fifteen miles from Clifton (Bosque Co.) where Belfrage lived and is the type locality. Of the other two specimens in my collection, one was taken at Lake Brownwood State Park, the other at Big Bend National Park.

ACKNOWLEDGMENTS

The U. S. National Museum loaned me ten specimens of the new species; Dr. E. L. Todd arranged the loan of these specimens, informed me of the location of the type of *H. superba*, reviewed the manuscript, and made many helpful suggestions. Dr. R. W. Poole, of the Illinois Natural History Survey, dissected the type of *H. superba* and arranged for its loan. Dr. F. H. Rindge examined and dissected several specimens in the American Museum of Natural History and arranged for their loan. Dr. Allan Watson of the British Museum (Natural History) compared my drawings and photographs to specimens in his care. Dr. J. G. Franclemont suggested this project and offered points of advice all along. To each of these men I extend my gratitude. I would also like to thank the Bureau of Sport Fisheries and Wildlife for authorization to collect in the Santa Ana Refuge, and the Texas Parks and Wildlife Department for authorization to collect in the State owned Wildlife Management Areas.

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